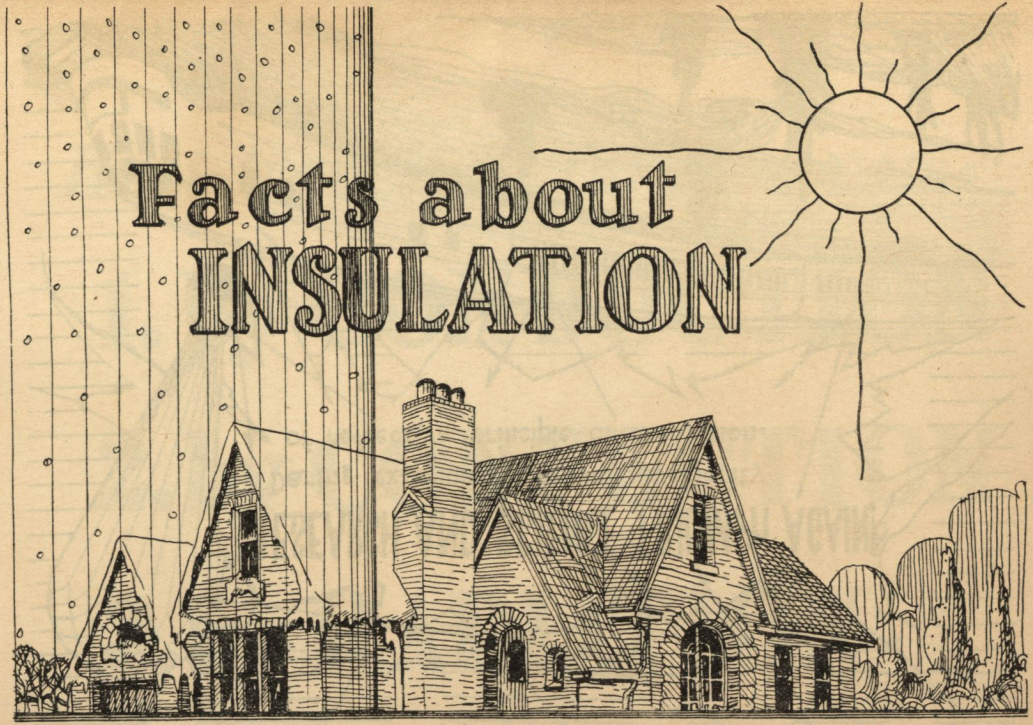
FACTS ABOUT INSULATION

SILVERCOTE

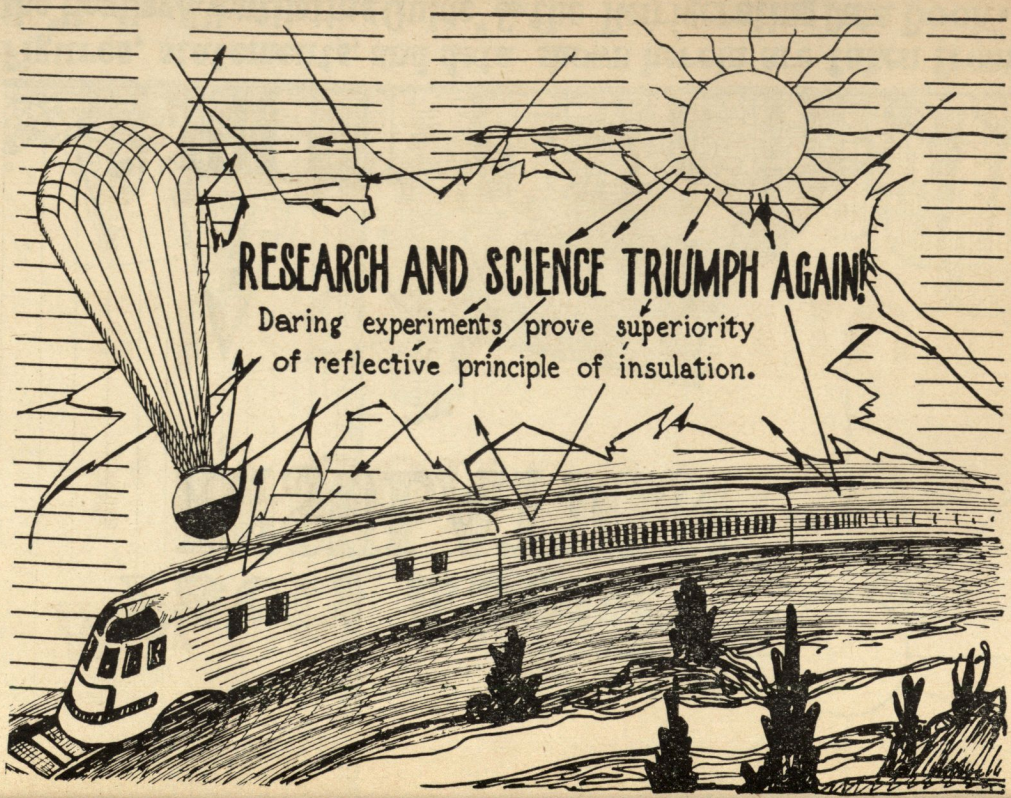
Reflective Insulation

SILVERCOTE PRODUCTS, INC.
KALAMAZOO, MICHIGAN

Facts about INSULATION



Figures, statements, and data shown herein are taken from the "Heating & Ventilating Guide" & the "Refrigerating Data Book".

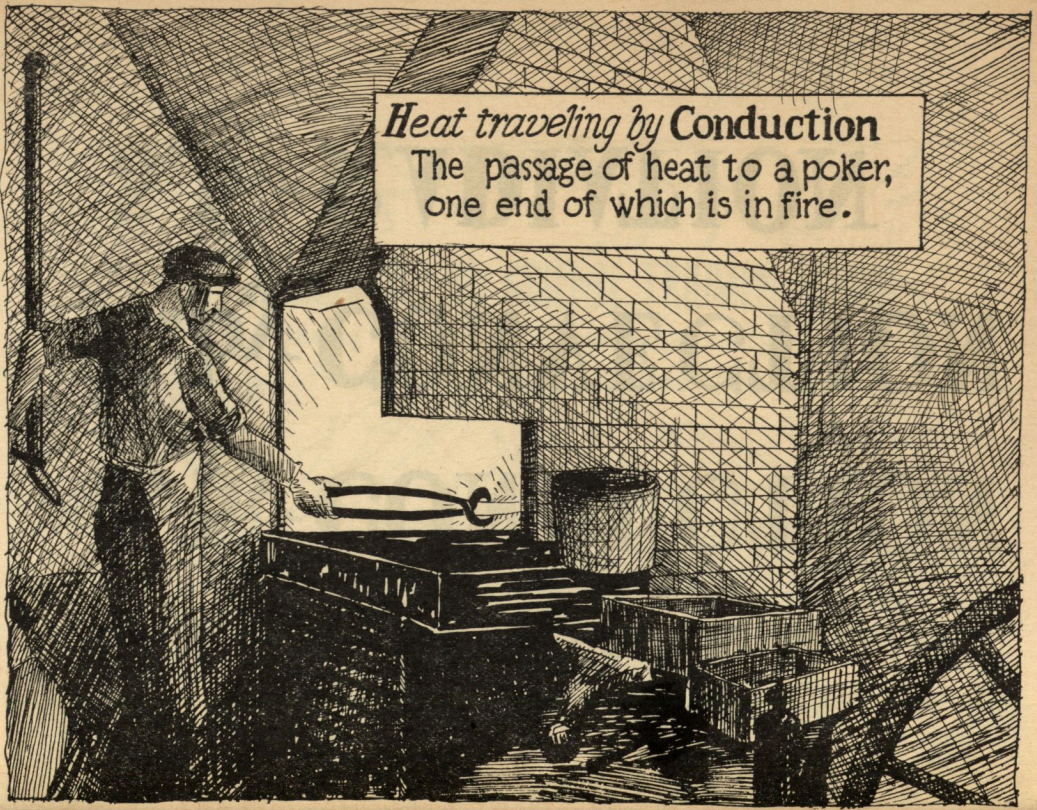

RESEARCH AND SCIENCE TRIUMPH AGAIN!
Daring experiments prove superiority
of reflective principle of insulation.

Heat travels in three ways:

1. by CONDUCTION

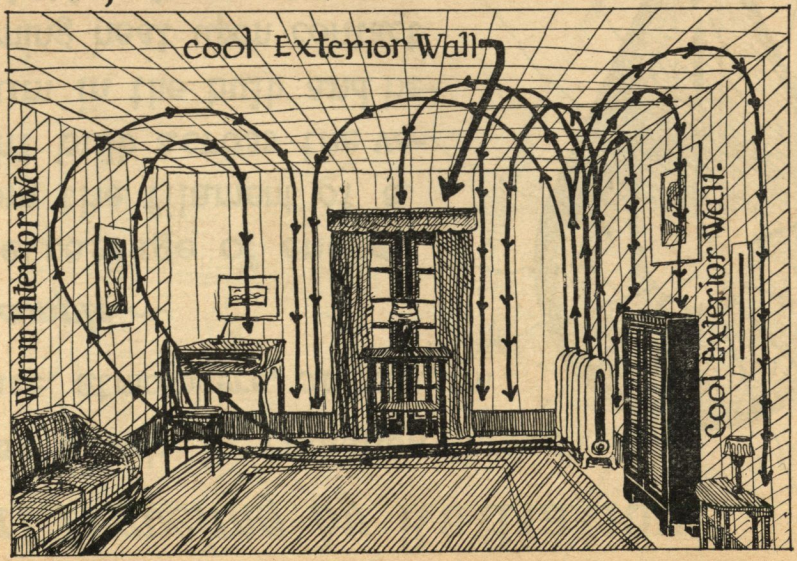
2. by CONVECTION

3. by RADIATION


Heat traveling by **Conduction**
The passage of heat to a poker,
one end of which is in fire.

Heat traveling by Convection

The rising of heated air, its passage to the ceiling, usually upwards along interior heated walls, downward along cooler "exterior" walls and windows, - or the movement of heated air.

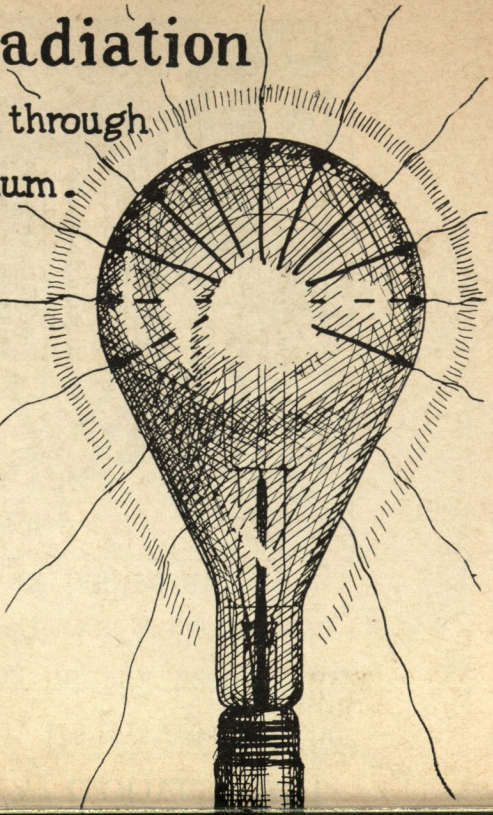


Heat traveling by Radiation

Heat travels by radiation through space, atmosphere, or vacuum.

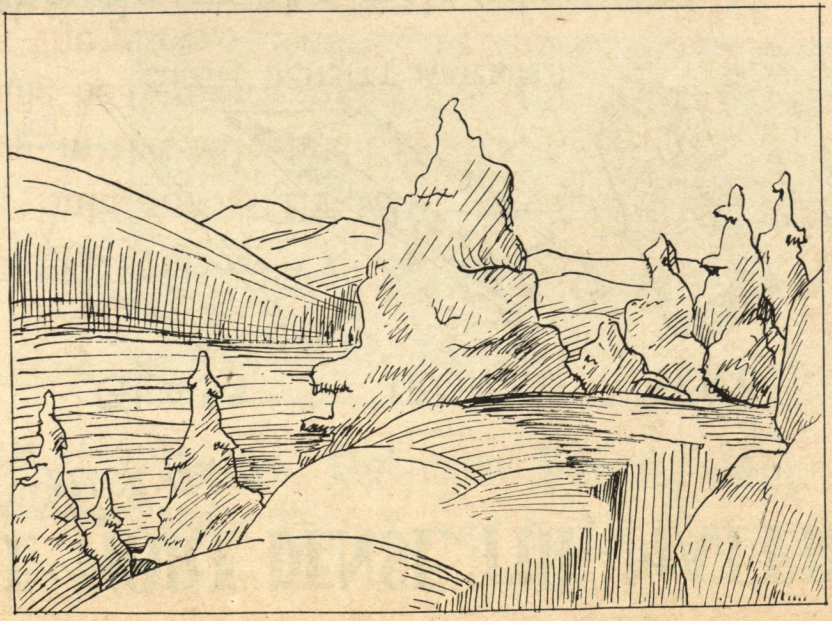
Example ~

The passage of energy from the filament of a light bulb across the vacuum in the bulb and becoming heat upon contact with the glass.



60% to **80%** of all heat loss through a wall is in the form of radiant heat.

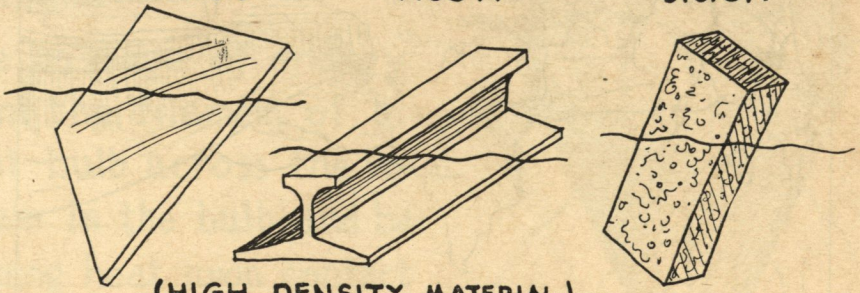
Heat is a form of energy. Cold is simply an expression indicating lower temperatures. It is not a form of energy. Cold is simply an absence of heat in some degree.



THE MORE DENSE THE MATERIAL

such as ~

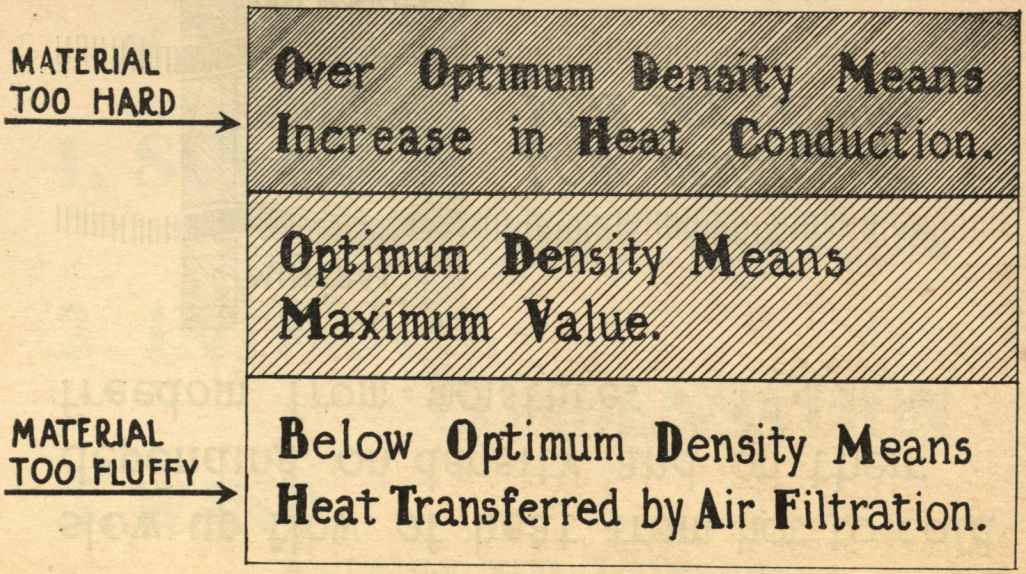
GLASS IRON BRICK



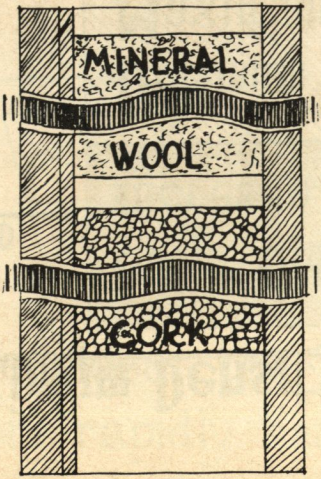
(HIGH DENSITY MATERIAL)

the closer the molecules, and the more rapidly heat is conducted through the material.

Optimum Density.



Conductive types of insulation merely slow up flow of heat from hot to cold depending on density and on their freedom from moisture.



LOW DENSITY AT BONE DRY RATINGS

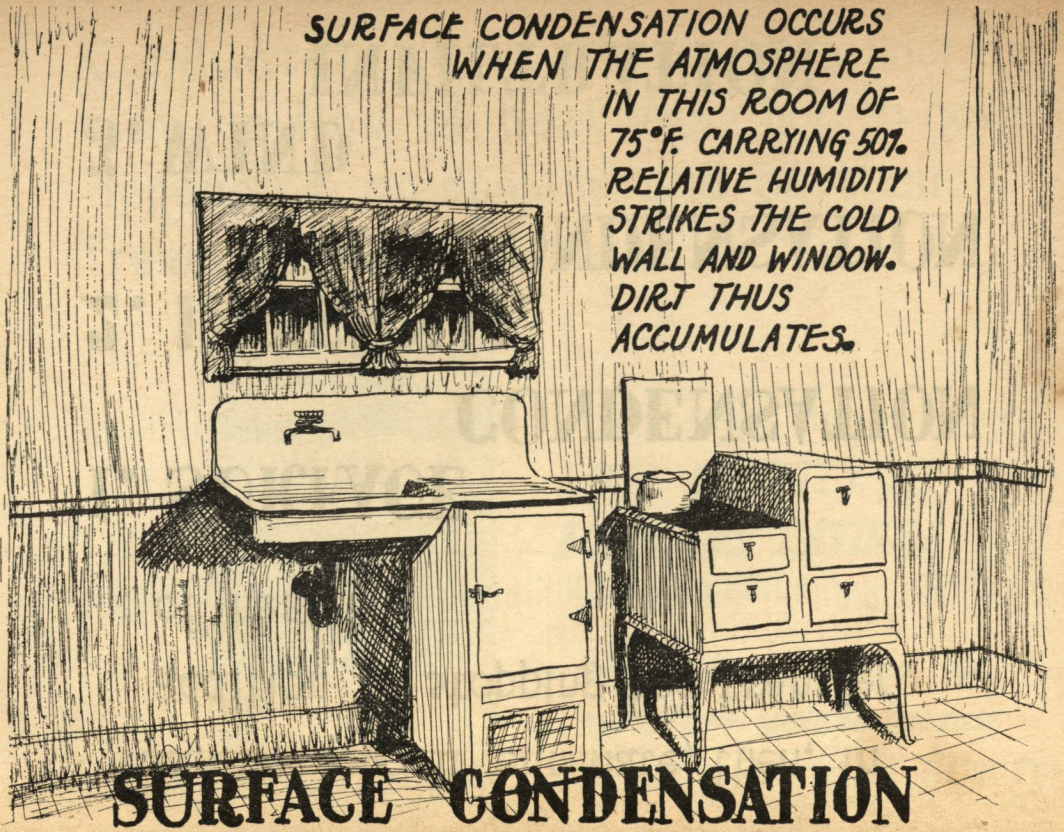
Both depreciated by moisture uptake because moisture increases density.

Insulation should eliminate, then, in addition to stopping the transfer of heat ~

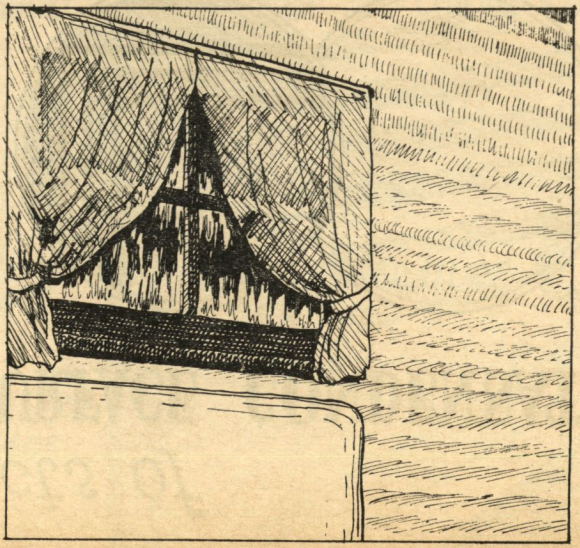
1. SURFACE CONDENSATION

2. INTERNAL CONDENSATION

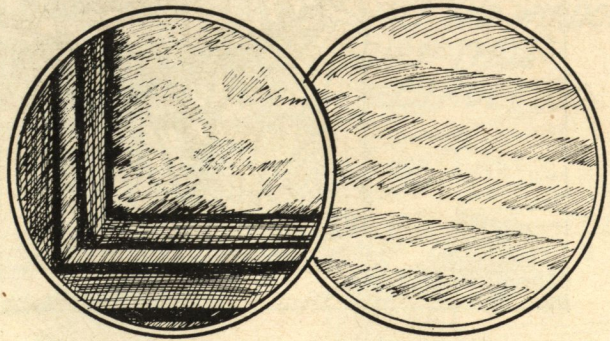
3. WIND INFILTRATION


SURFACE CONDENSATION OCCURS WHEN THE ATMOSPHERE IN THIS ROOM OF 75°F. CARRYING 50% RELATIVE HUMIDITY STRIKES THE COLD WALL AND WINDOW. DIRT THUS ACCUMULATES.
SURFACE CONDENSATION

A closeup of this cold kitchen wall and window looks like this — frost on windows and dirty lath marks on walls.



Effects of
SURFACE CONDENSATION

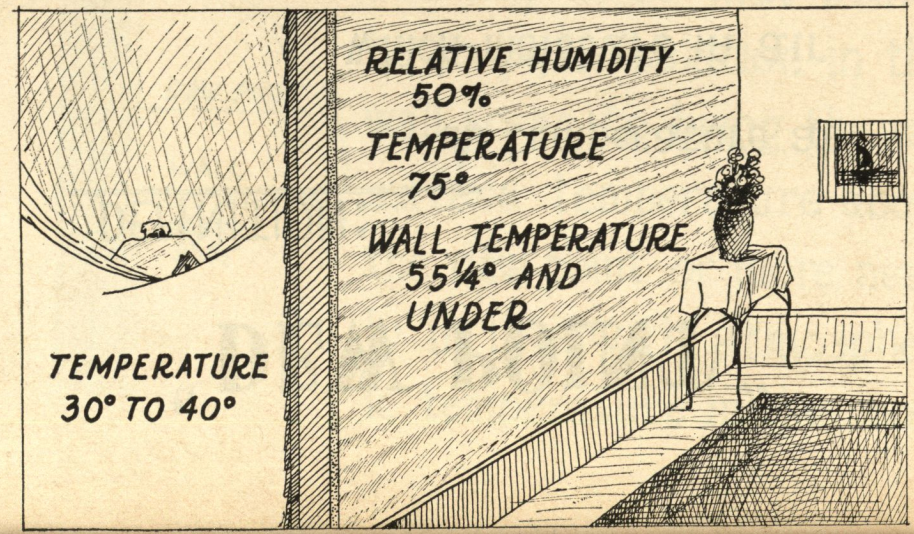


DIRT DEPOSITS LATH MARKS

The dirty walls in the room indicate source of heat loss.

Why lath marks?

The plaster space between each of the laths is lower in temperature; hence, a greater amount of dirt and moisture is deposited, and greater heat losses occur at these spaces.

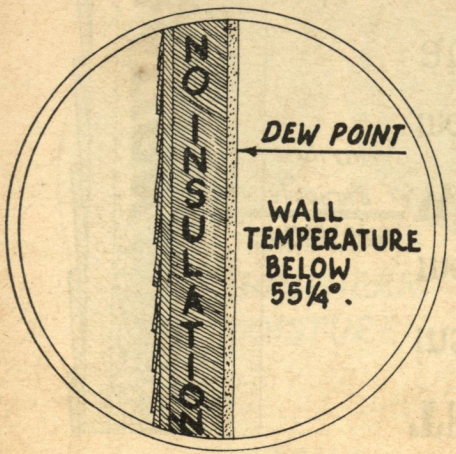


"DEW POINT"

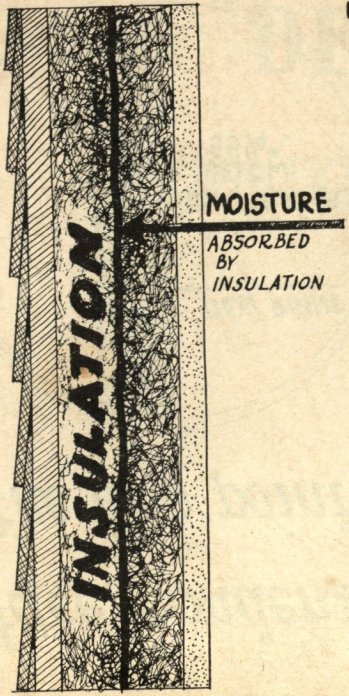
DEFINITION:

A temperature at which moisture in air will no longer remain in suspension.

To eliminate lath marks and surface condensation we must move the dew point from the wall surface

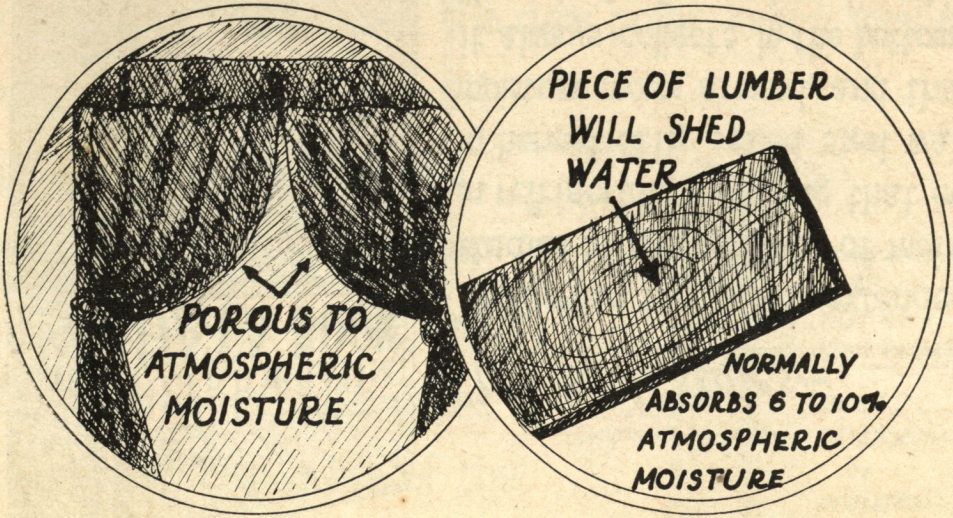


The way to do that would be to put insulation in the wall so as to bring the wall surface temperature above the dew point or more nearly in line with atmospheric temperature in the room.



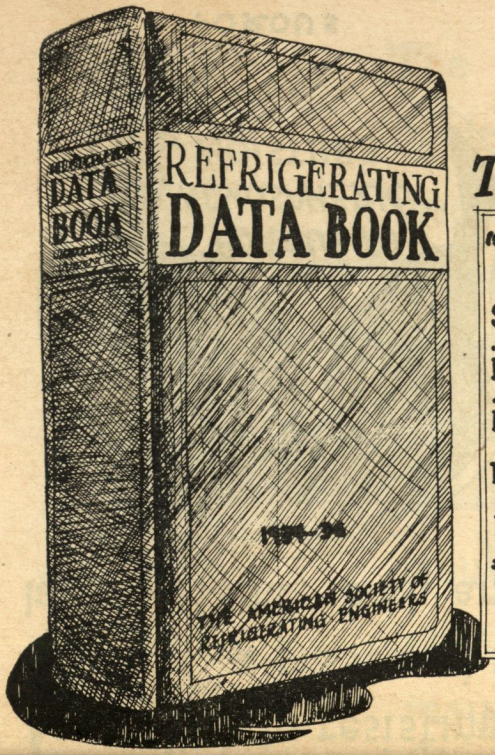
The cold outside air and the inside warm moist air **MUST** meet somewhere in the wall. When they meet the warm moist air is cooled, thus creating a dew point causing moisture accumulation in the insulation itself. This increases the density of the insulation material.

As applied to resisting penetration of atmospheric moisture, a plastered wall may be compared with a lace curtain. Both are porous to that element.



POROUS

WATERPROOF, BUT NOT MOISTURE PROOF

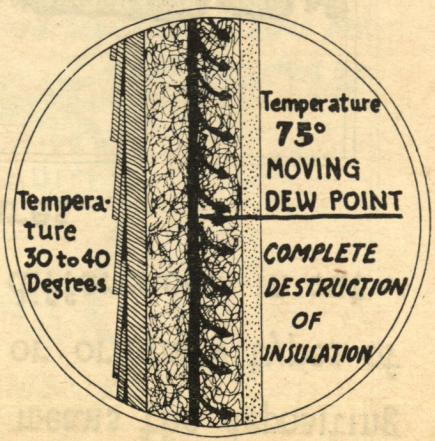


This book states~

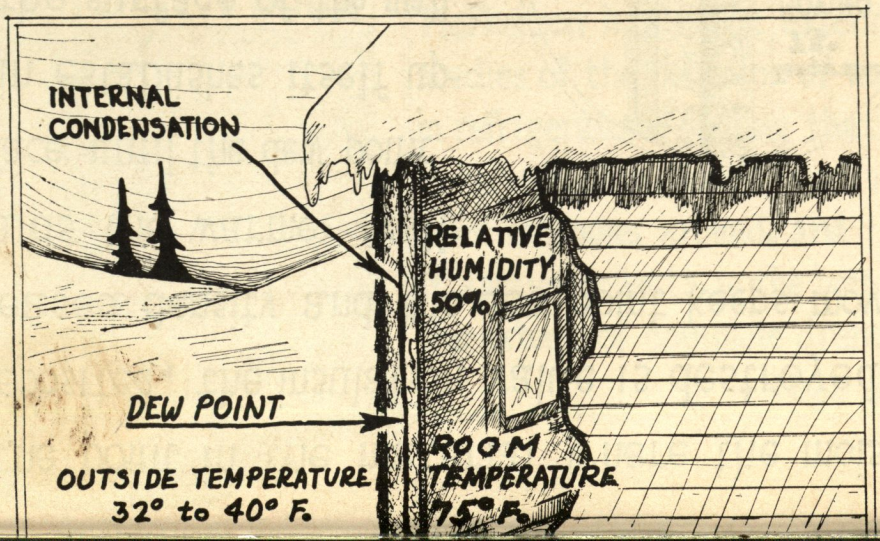
"McPherson has made extended studies of the behavior of moisture in refrigerators, finding that even in hermetically sealed steel walls moisture moves around, and that it always collects in the bottom to the extent of complete drenching."

Page 239

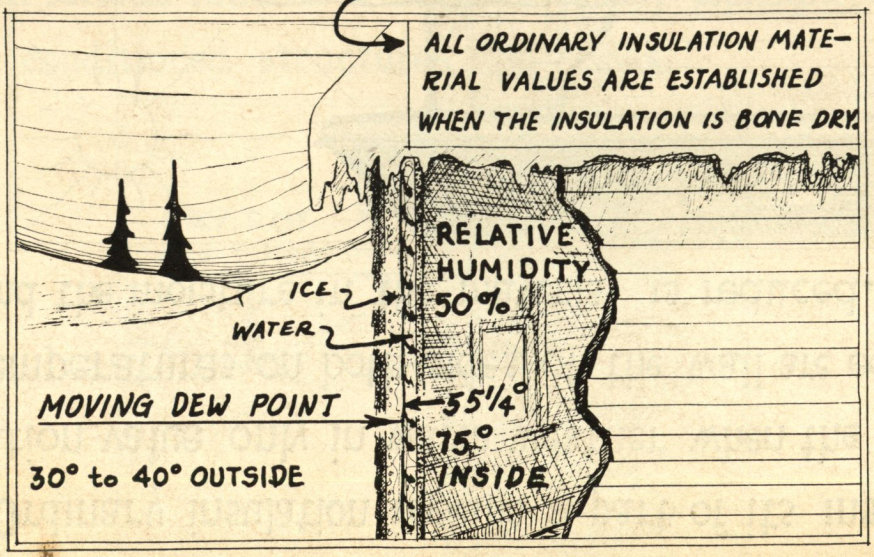
At the point in the material where the moisture is deposited, the insulation value is destroyed by increased density and the dew point keeps moving towards the warmer wall surface until the dew point again establishes itself upon the surface of the wall. This proves definite depreciation of the value of the insulation.



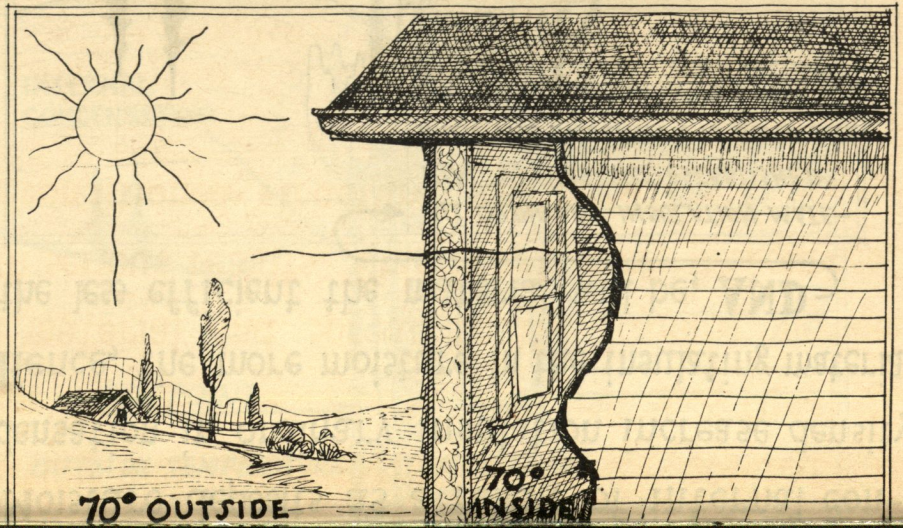
"*Internal Condensation*" means the depositing of moisture in conventional or ordinary types of insulation due to extreme differences in out-side and inside temperatures.



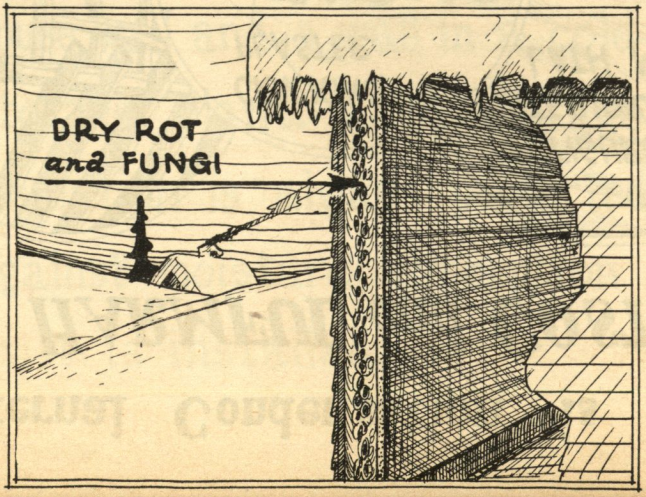
Moisture deposits as a result of internal condensation in ordinary insulation increase density. Hence, the more moisture in the insulating material the less efficient the material will be, **AND**



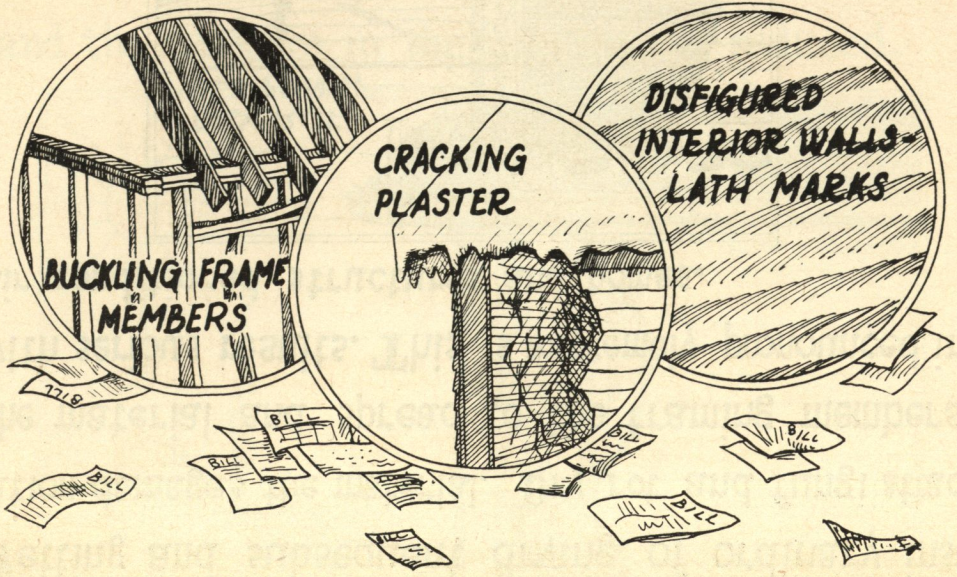
Ordinary insulation regains a part of its insulation value only in warm weather when the temperatures on both sides of the wall are equal and the moisture in the material is reduced.



Wetting and subsequent drying of ordinary insulation damages the material. Dry rot and fungi attack the material and spread to the framing members with serious results. This is extremely pronounced in air conditioned structures and homes.



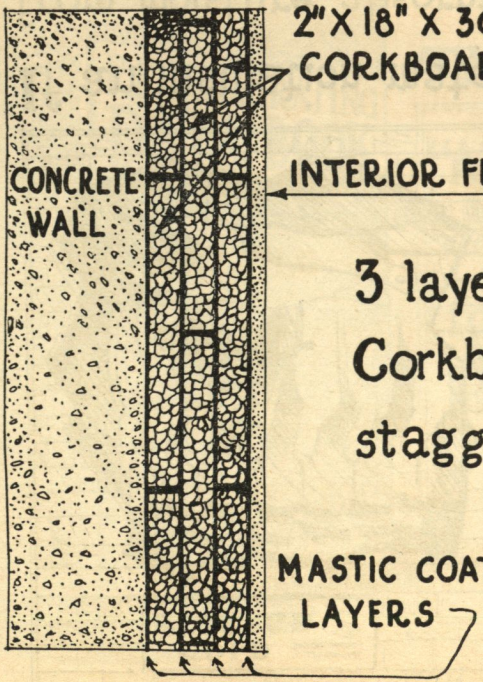
Internal Condensation is *HARMFUL and COSTLY!*



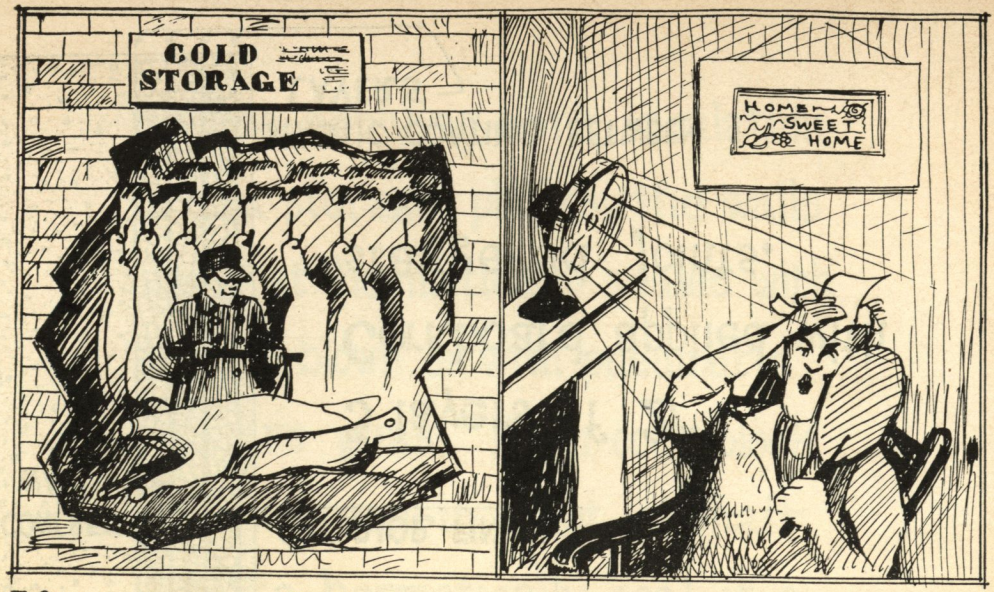
From the standpoint of temperature variation there is little difference between an ordinary house wall and a wall in a cold storage plant. Cold storage insulation is always protected against moisture absorption as it is installed.

Before applying cork insulation in cold storage plants, the walls are first hermetically sealed with asphalt blown on with pneumatic pressure guns. Each cork block is submerged in a hot asphalt bath to hermetically seal it a-gainst moisture absorption.

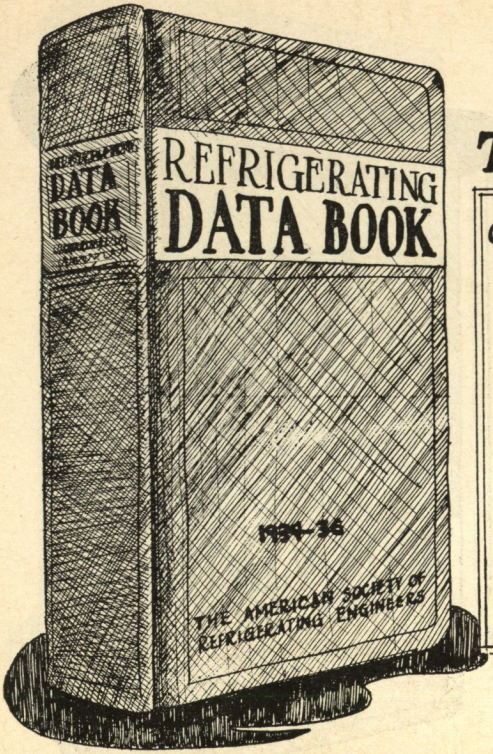
One method of constructing a cold storage wall:



3 layers of 2" Corkboard applied with staggered joints.



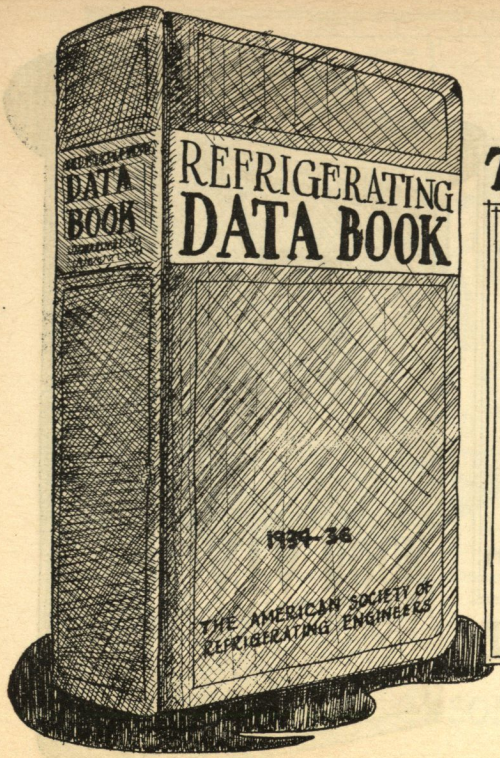
If an insulation material **MUST** be protected from moisture absorption in a cold storage plant, then it **SHOULD** be protected when used in a house.



This book states:

"An entirely satisfactory commercial method for applying insulation has not been found."

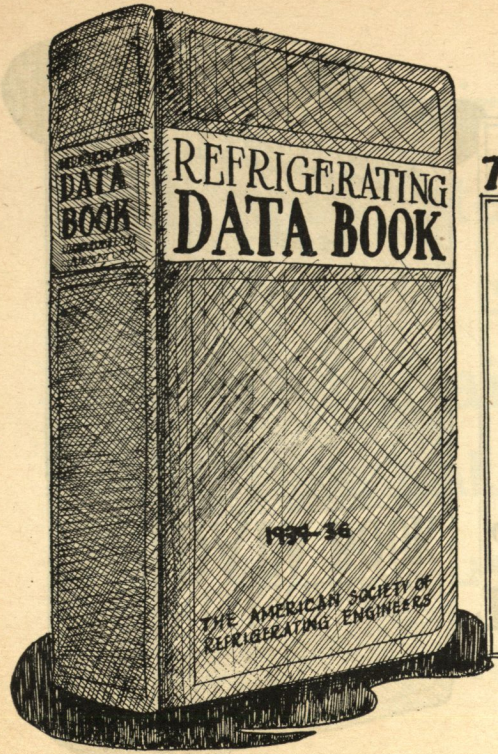
~ *Page 237*



This book states:

"Practical measures of moisture protection constitute the chief element of the problem of application of insulation."

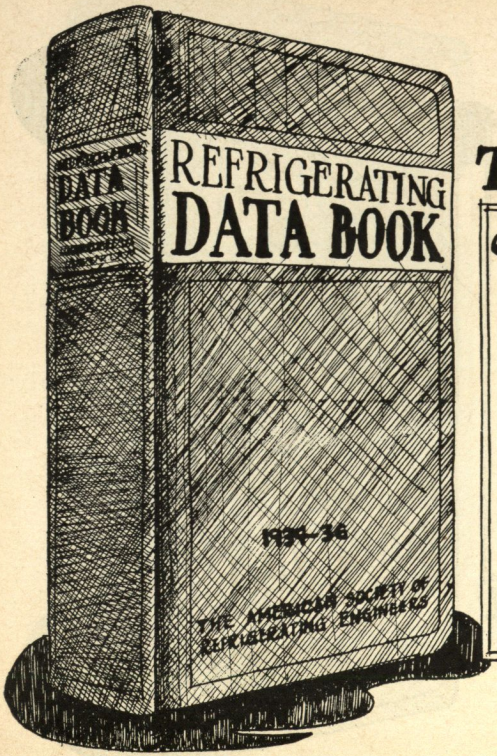
Page 237



This book states:

"No waterproof materials used in applying insulation are vapor proof."

-*Page 237*



This book states:

"Due to infiltration of moisture, insulating material deteriorates in time, causing loss of insulating value and disintegration."

~ Page 237

Winter air conditioning means stepping up the moisture content of heated air. This situation makes obsolete all porous, moisture absorbing forms of insulation.

At bone dry ordinary insulations provide a good insulation efficiency because they are porous.

But, in addition to moisture uptake, they are further depreciated by **WIND INFILTRATION** at cracks between siding and sheathing allowing wind to pass into the porous insulation itself.

"The natural movement of air through building construction is due to two causes. One is the pressure exerted by the wind; the other is the difference in density of outside and inside air because of differences in temperature."

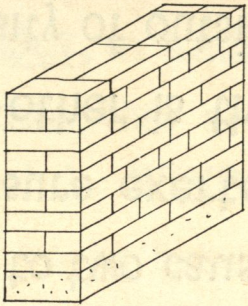
from the "Heating & Ventilating Guide"
Page 119

AIR INFILTRATION THROUGH WALLS

Expressed in cubic feet of wind infiltration per sqare foot of wall area per hour

8½" Brick Construction

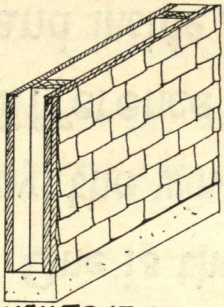
Wind Velocity 25 Miles per Hour.



INFILTRATION

18.6 cu. ft. per sq. ft. of wall area per hour.

Frame Construction

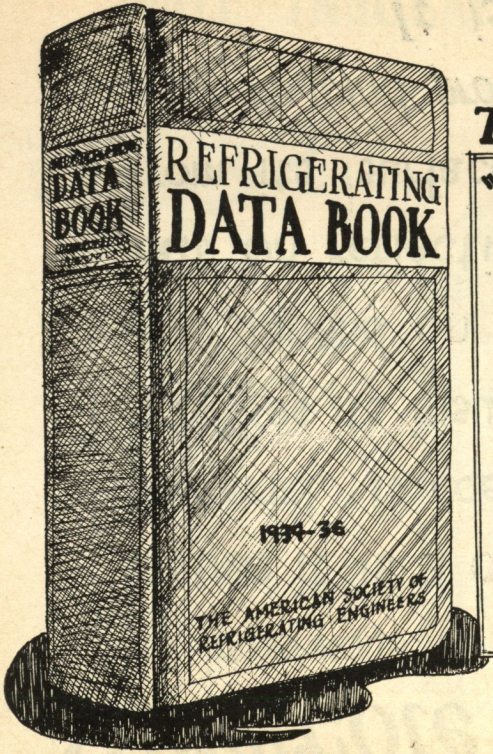


Wind Velocity 25 Miles per Hour.

INFILTRATION

35.0 cu. ft. per sq. ft. of wall area per hour.

From the "Heating & Ventilating Guide" — Page 120.



This book states:

"It cannot be said too often, however, that conductivity of laboratory samples on the thickness basis has had more attention than it deserves. It is only part of the story, even in theory, and in practise the other items discussed here may quite overshadow it."

Page 231

Silvercote Fabric

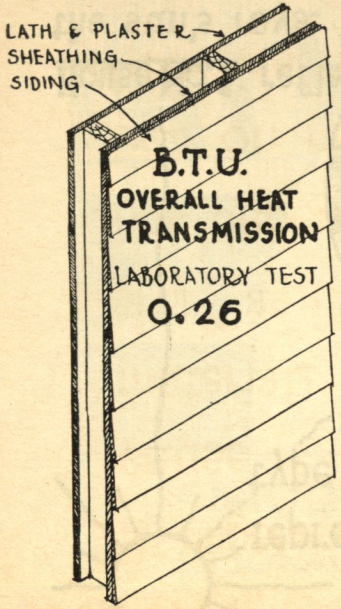
is impervious to wind infiltration because it is a dense, homogeneous material. It does not consider "Density" as its insulation efficiency does not depend on slow conduction, but on reflection of heat from its surface.

It is wind proof –

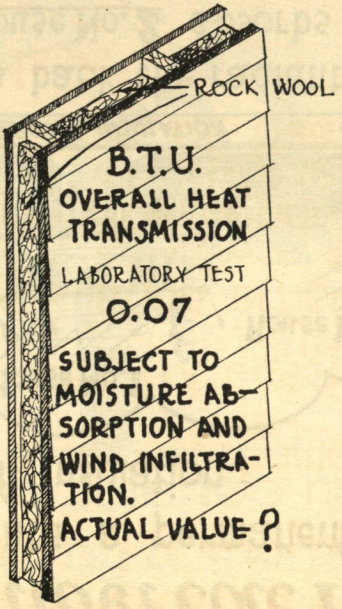
It is moisture proof.

WALL INSULATION EFFICIENCIES

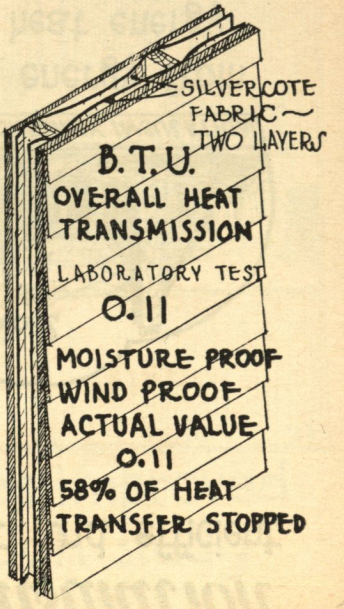
NO INSULATION



ROCK WOOL

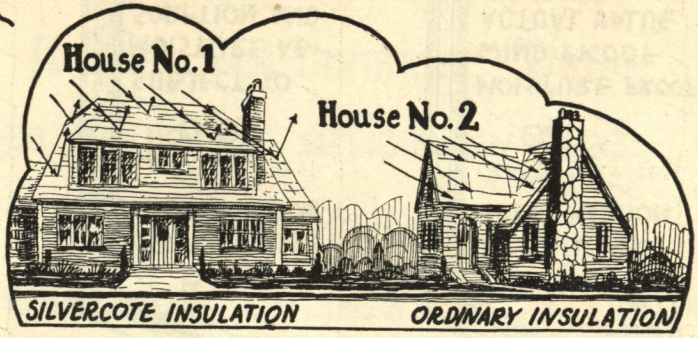


SILVERCOTE FABRIC

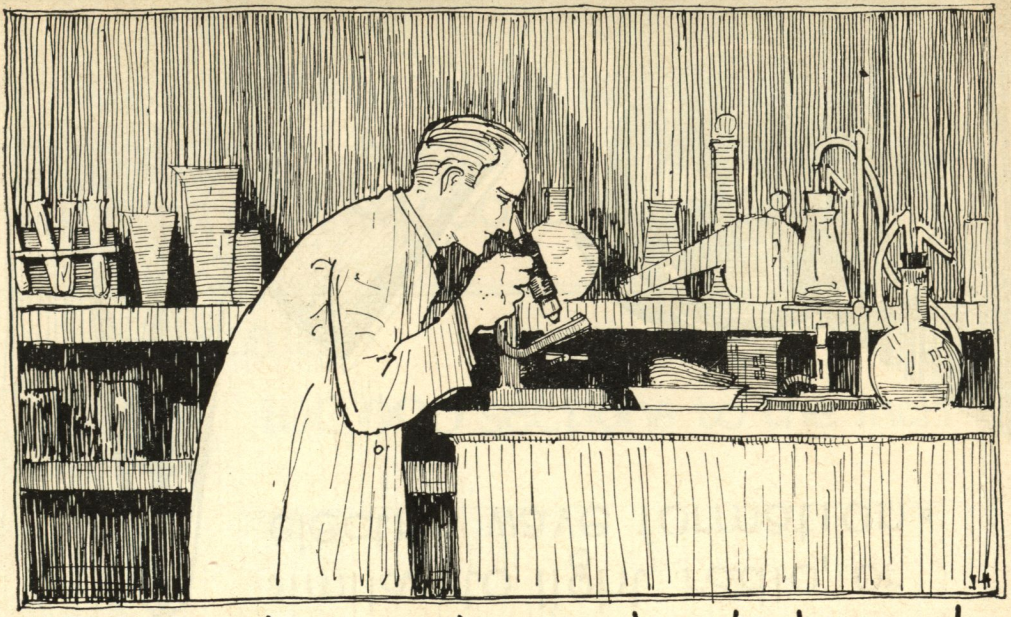


Silvercote Insulation

represents a permanent and efficient type of insulation.



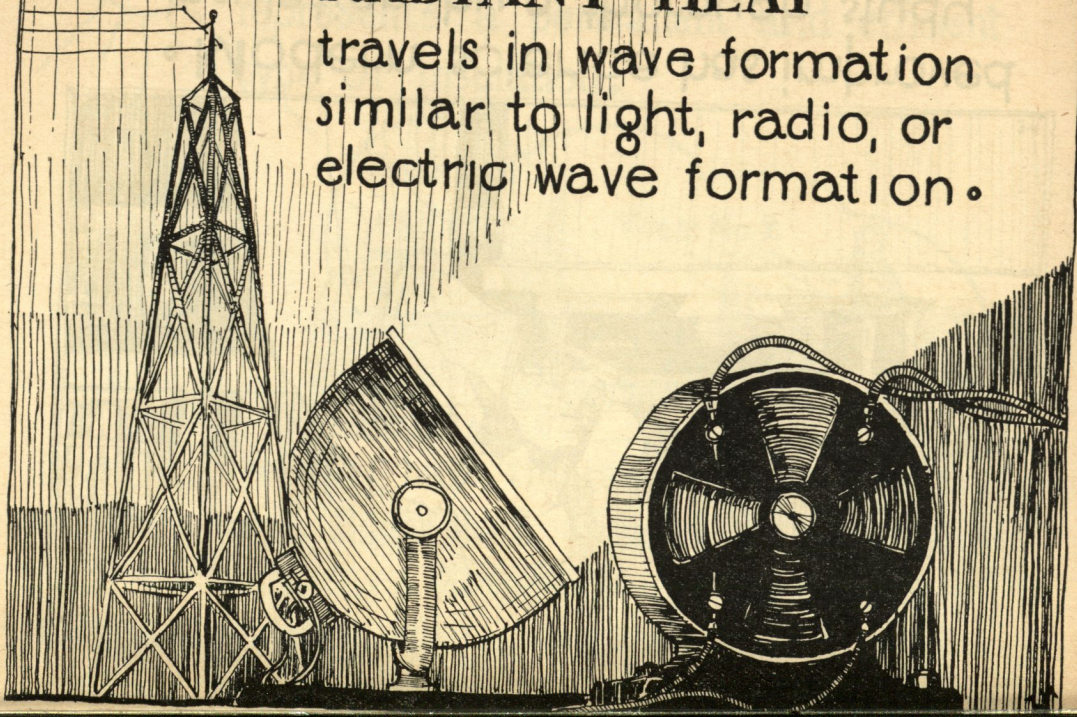
House No. 1 reflects back the radiant energy from the sun's rays. House No. 2 absorbs heat energy from the sun's rays, keeping the attic and bedrooms at an uncomfortable temperature even after midnight in hot weather.



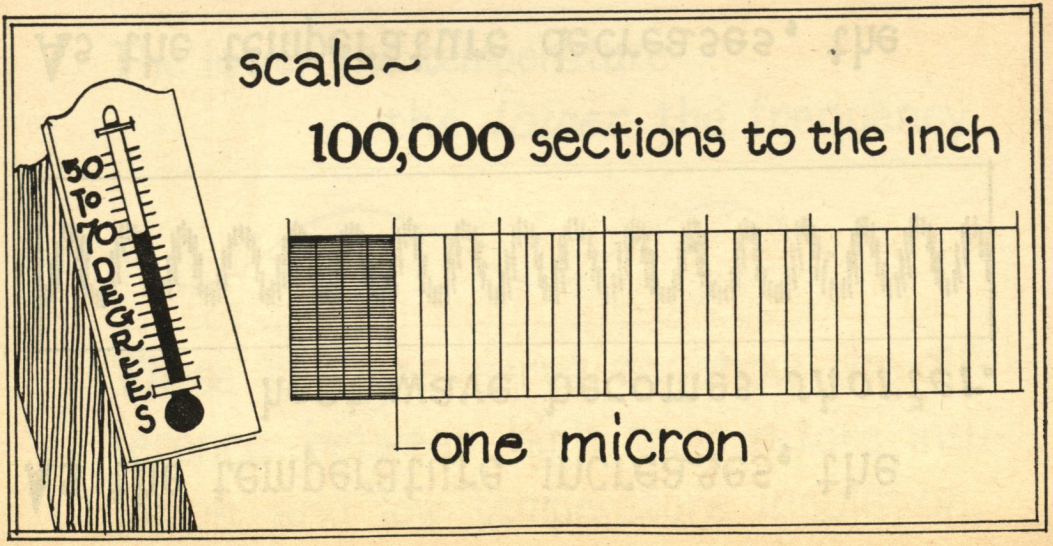
• Modern science has improved insulation by a thorough study of heat •

RADIANT HEAT

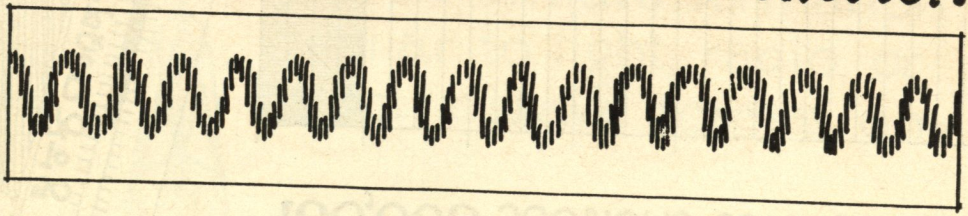
travels in wave formation similar to light, radio, or electric wave formation.



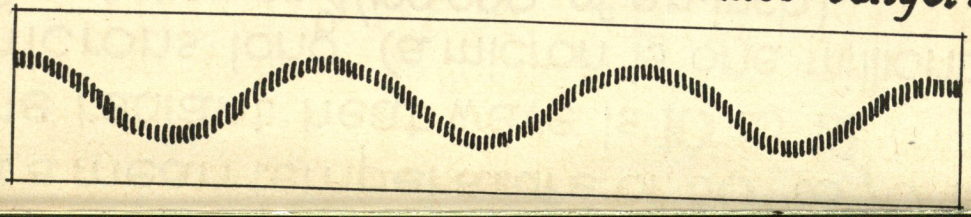
At a mean temperature of 50° to 70° F. the radiant heat wave is 10 to 12 microns long (a micron is one millionth of a meter or 4/100,000 of an inch).



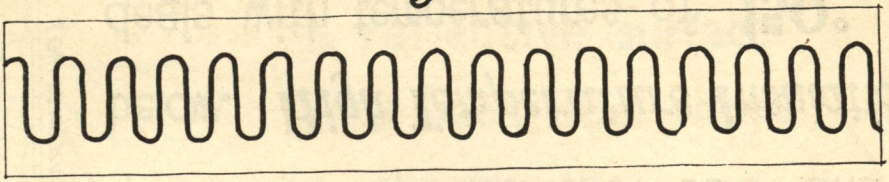
As the temperature increases, the heat wave becomes *shorter.*



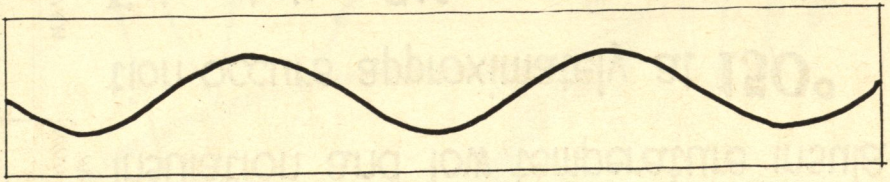
As the temperature decreases, the heat wave becomes *longer.*



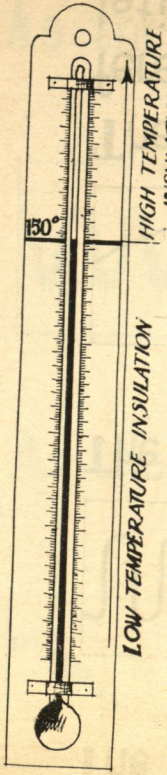
The higher the temperature
the *higher* the frequency



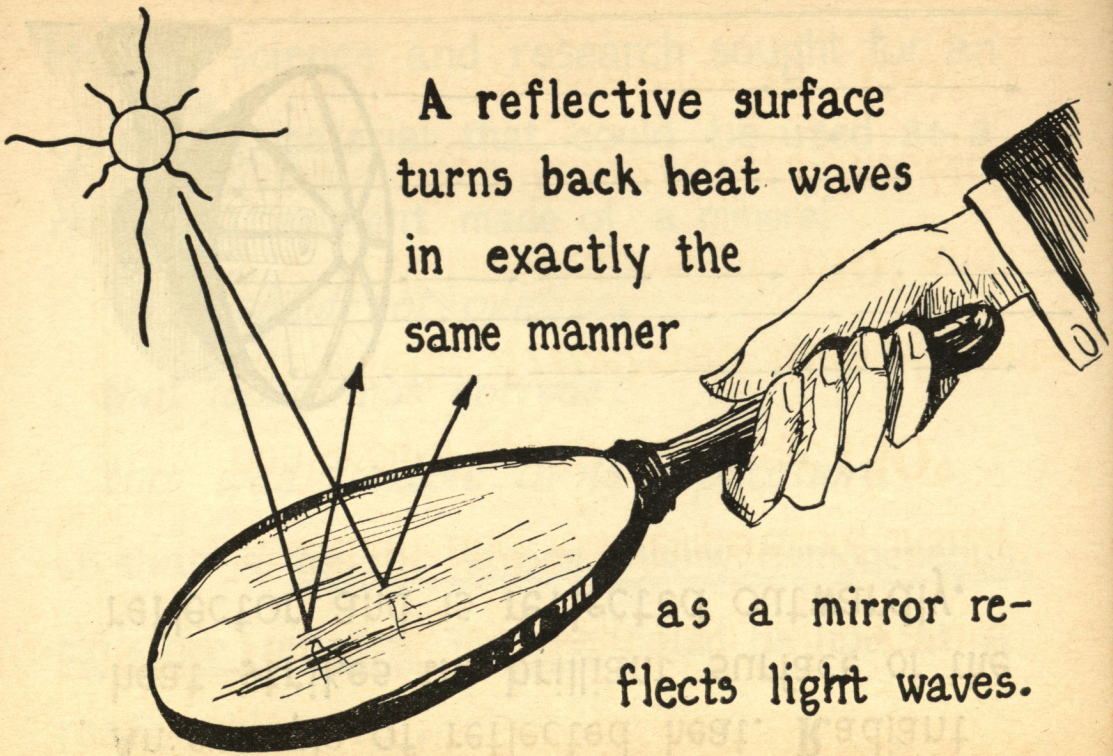
The lower the temperature
the *lower* the frequency



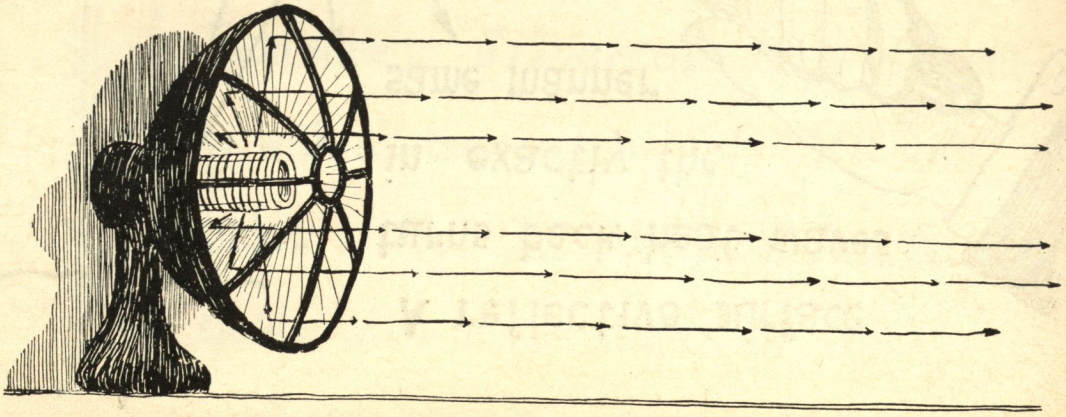
These changes serve to show the difference between high temperature insulation and low temperature insulation.



The break between high temperature insulation and low temperature insulation occurs approximately at **150°** Fahrenheit. ***Silvercote*** deals efficiently with all temperatures of **150°** and below. ***High Temperature Insulation*** deals with temperatures of **150°** and up.


A reflective surface
turns back heat waves
in exactly the
same manner
as a mirror re-
flects light waves.

An example of reflected heat. Radiant heat strikes the brilliant surface of the reflector and is reflected outwardly.



Modern science and research sought for an insulating material that could be used as a reflecting element made of a mineral

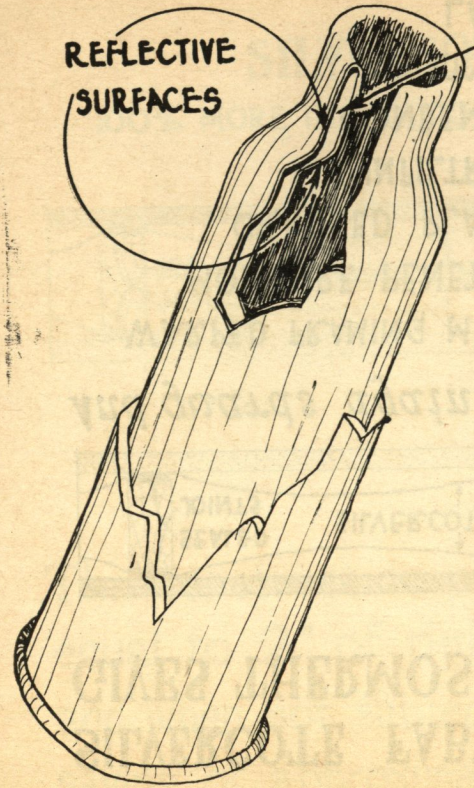
that would not oxidize,

that would not corrode,

that was flexible in its application,

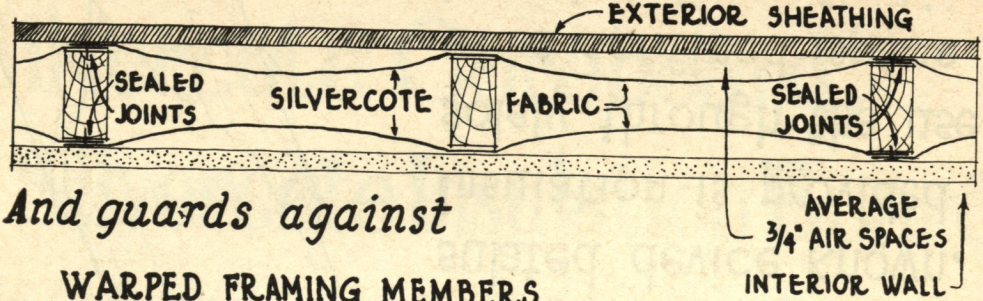
so that a tough, strong, highly homogeneous, moisture repelling surface could be had at a reasonable price.

Silvercote Fabric,
Silvercote Coreboard,
Silvercote Insulation Board
effectively correct the moisture problem and stop wind infiltration.



The Thermos bottle is the most efficiently insulated device known. Insulation is provided solely through the use of a confined space bounded by reflective surfaces.

SILVERCOTE FABRIC INSTALLED IN WALLS GIVES THERMOS BOTTLE CONSTRUCTION

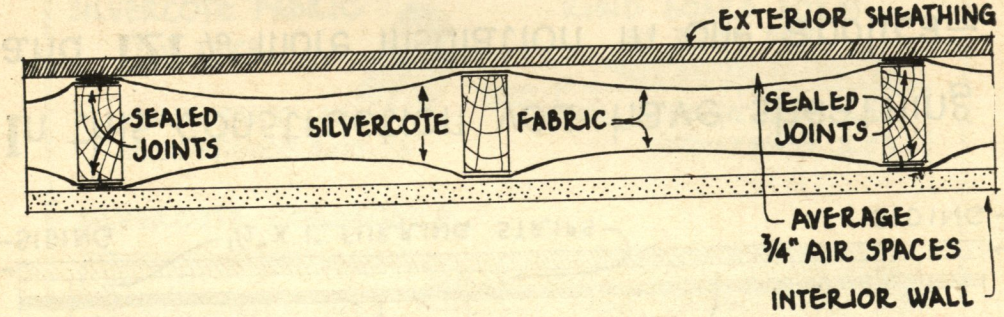


And guards against

WARPED FRAMING MEMBERS
MOISTURE PENETRATION
CRACKED PLASTER
AIR INFILTRATION
CONDENSATION
DIRTY WALLS
LATH MARKS

SILVERCOTE — FABRIC

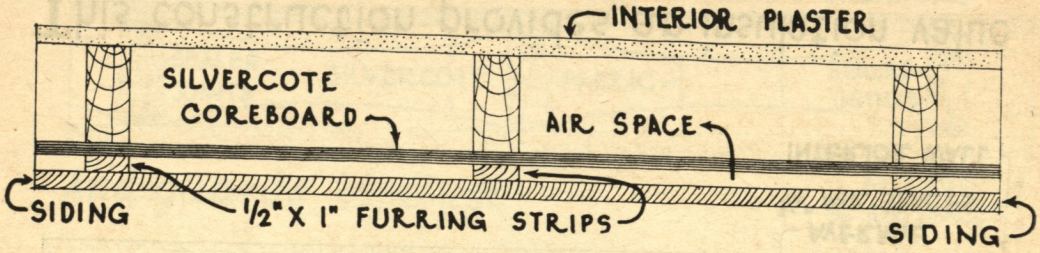
100% MORE INSULATION — ½ THE COST



This construction provides an insulation value equal to 2" of rigid board form (at bone dry and when not subject to wind infiltration) at a saving of approximately 2/3 in cost.

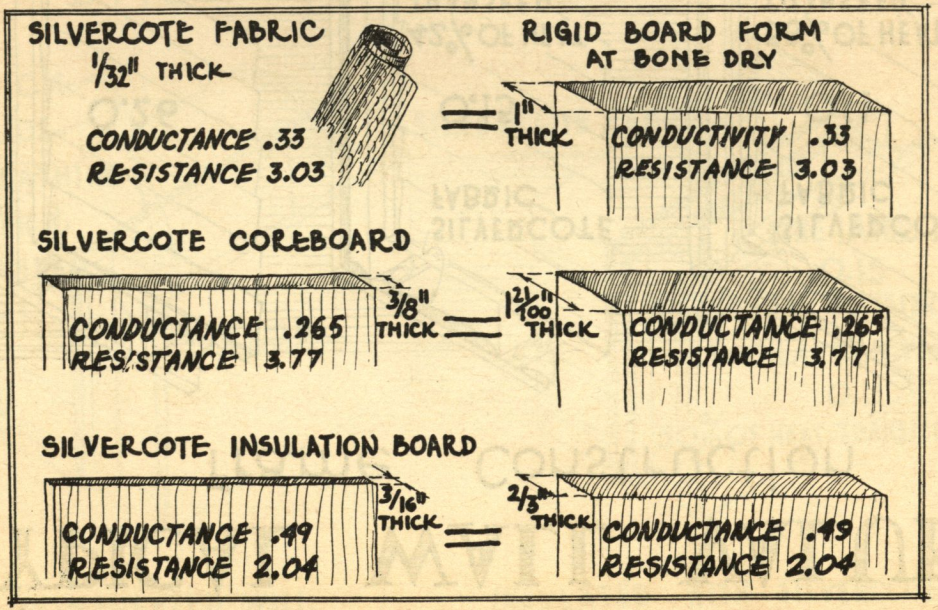
SILVERCOTE COREBOARD

AS EXTERIOR SHEATHING



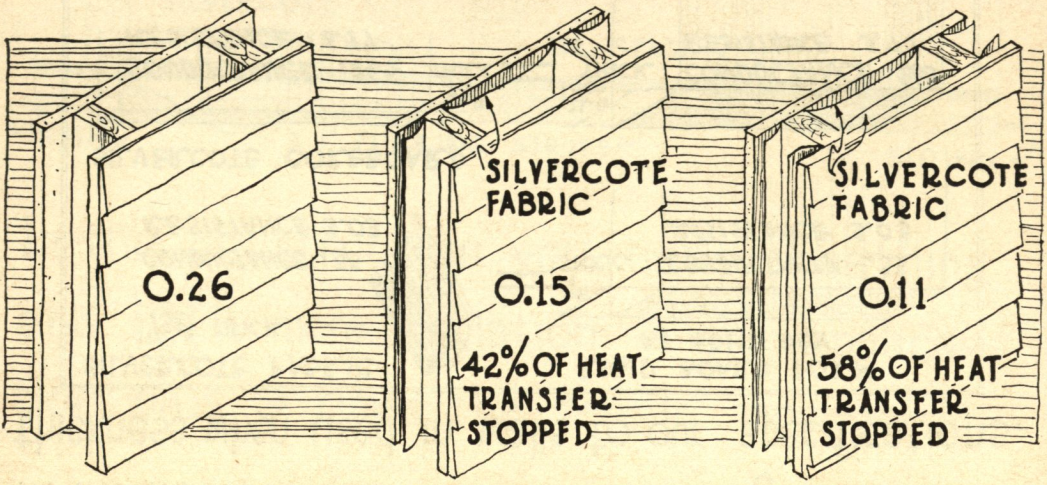
In this construction you have sheathing and **121%** more insulation in one application plus **9** times the tensile strength.

One layer of each Silvercote Product is equal in insulation value to the following charted thickness when used in walls to our specifications.



TYPICAL WALL VALUES

Frame Construction



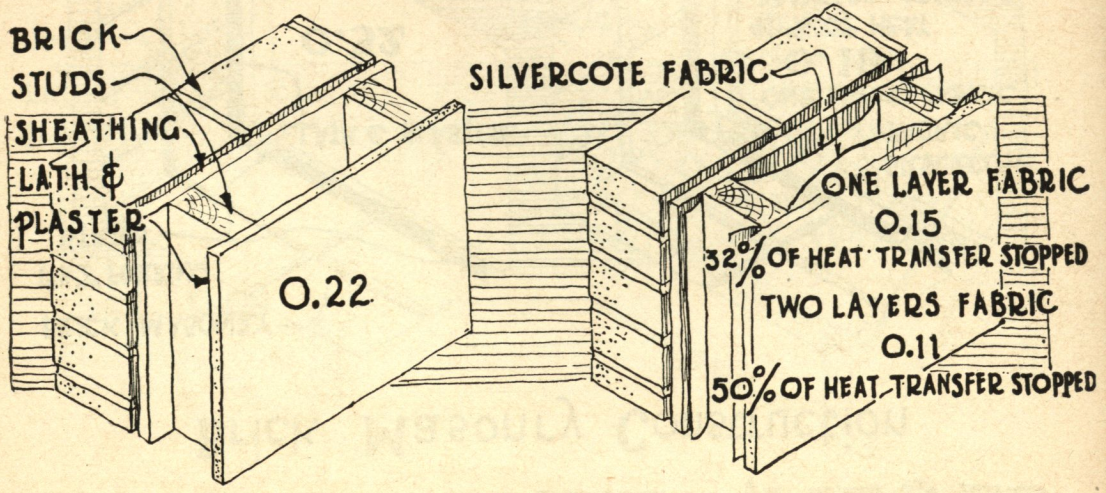
NO INSULATION IN WALL

ONE LAYER OF SILVERCOTE FABRIC

TWO LAYERS OF SILVERCOTE FABRIC

TYPICAL WALL VALUES

Brick Veneer Construction

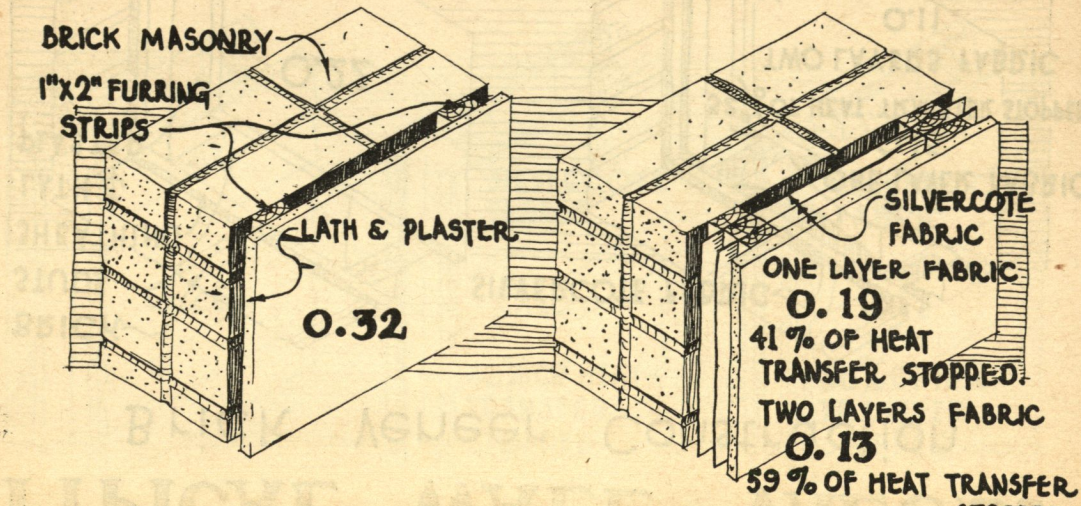


UNINSULATED WALL

INSULATED WITH SILVERCOTE

TYPICAL WALL VALUES

Brick Masonry Construction

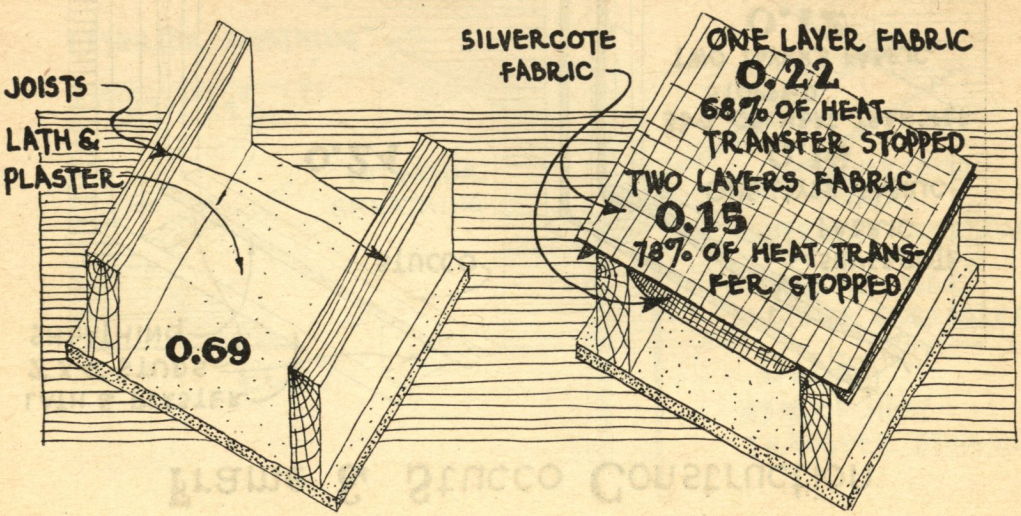


8½" BRICK WALL UNINSULATED

8½" BRICK WALL INSULATED WITH SILVERCOTE

TYPICAL WALL VALUES

Attic Insulation

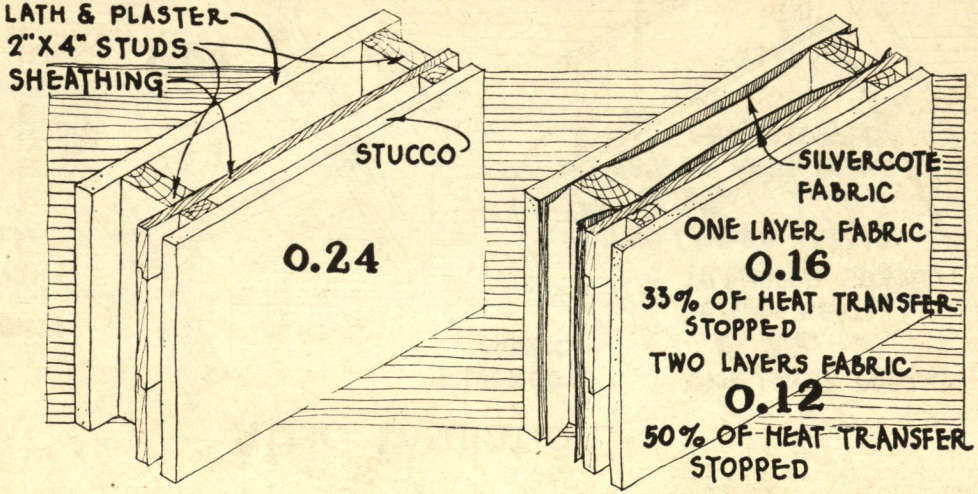


ATTIC FLOOR UNINSULATED ::::

ATTIC FLOOR INSULATED WITH SILVERCOTE

TYPICAL WALL VALUES

Frame & Stucco Construction

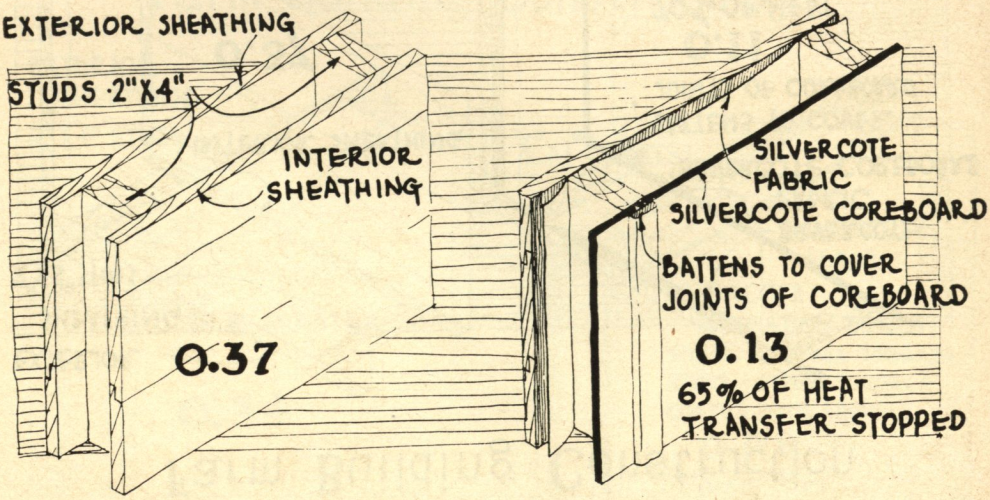


STUCCO WALL
NO INSULATION

STUCCO WALL- INSULATED
WITH SILVERCOTE

TYPICAL WALL VALUES

Farm Building Construction

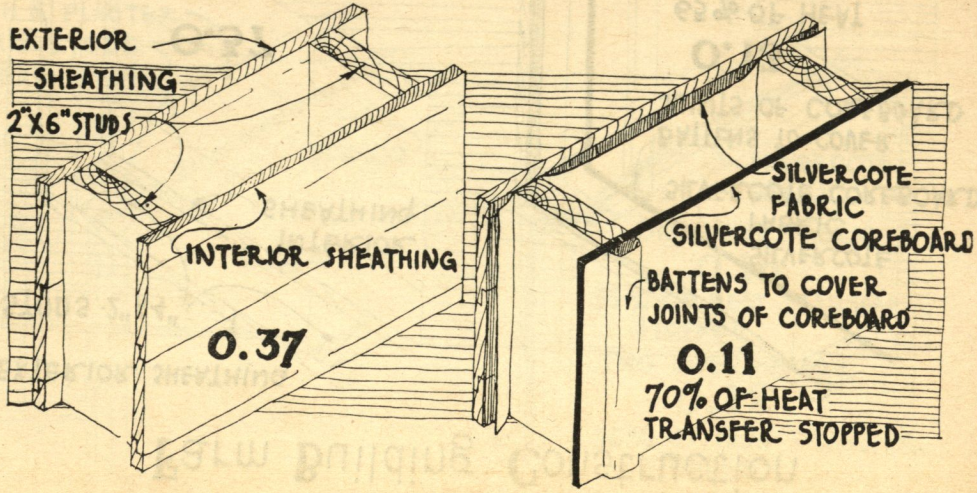


TYPICAL BROODER HOUSE WALL — UNINSULATED

BROODER HOUSE WALL — INSULATED WITH SILVERCOTE

TYPICAL WALL VALUES

Farm Building Construction

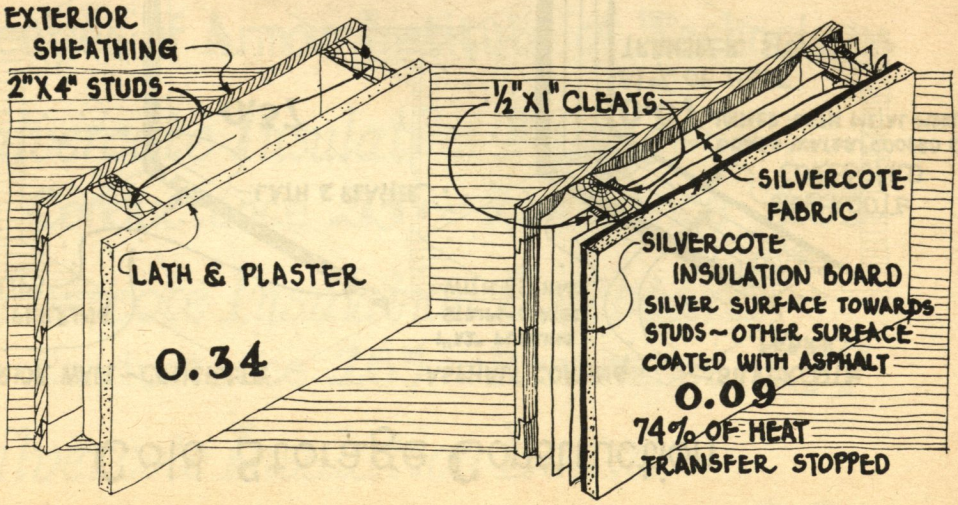


TYPICAL DAIRY BARN
WALL — UNINSULATED

DAIRY BARN WALL —
INSULATED WITH SILVERCOTE

TYPICAL WALL VALUES

Farm Building Construction

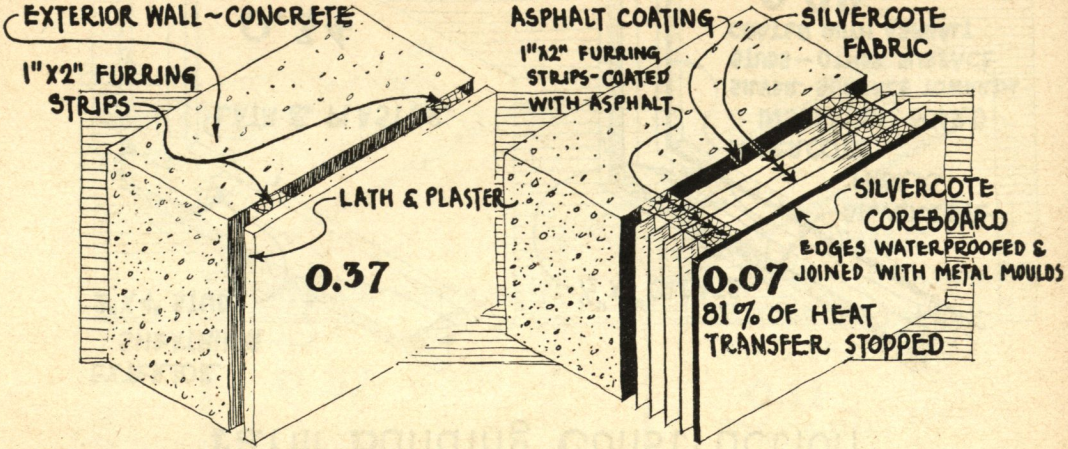


WALL FOR COLD ROOM FOR MILK, FRUIT, PRODUCE, ETC. ~ UNINSULATED

COLD ROOM WALL ~ INSULATED WITH SILVERCOTE

TYPICAL WALL VALUES

Cold Storage Construction



COLD STORAGE WALL
NO INSULATION

COLD STORAGE WALL
SILVERCOTE INSULATION

All values claimed for Silvercote Insulation Products are confirmed by Professor J.C. Peebles of Armour Institute of Technology.

Silvercote Insulation Fabric~

Conductance .33 ~ Resistance 3.03

Silvercote Insulation Coreboard~

Conductance .265 ~ Resistance 3.77

Silvercote Insulation Board~

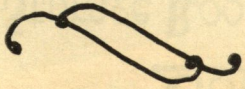
Conductance .49 ~ Resistance 2.04

SILVERCOTE FULFILLS EVERY INSULATION REQUIREMENT

such as:

Structural Building

Houses
Barns
Chicken Houses
Hog Houses
Railroads
Automobiles
Marine Boats



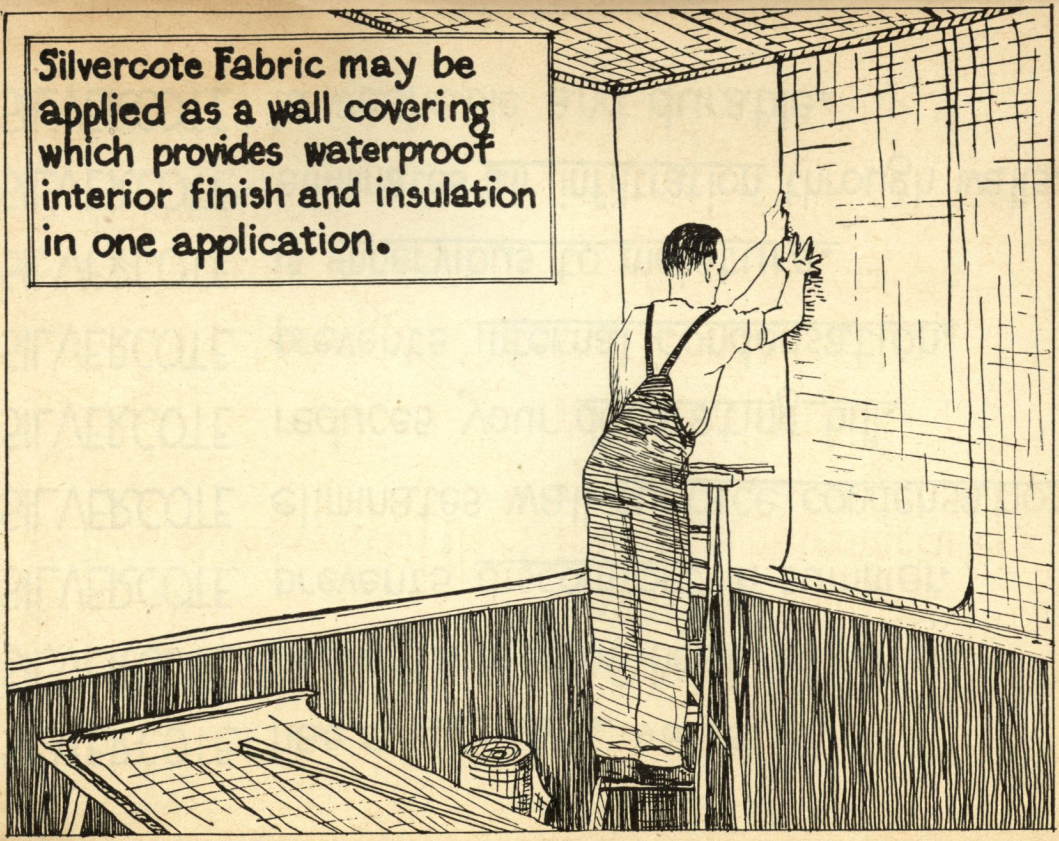
Decoration

Department Stores
Retail Stores
Theatres
Merchants
for
Interior Finish
Window Backrounds
Signs & Placards
Displays

Cold Storage

Cold Storage Rooms
Breweries
Railway Refrigerated Cars
Tank Cars
Refrigerated Trucks
Meat Packers
Meat Markets
Bottling Companies
Bottling Company Distributors
Candy Manufacturers
Candy Distributors
Ice Cream Manufacturers
Creameries
Dairy Farms
Fur Storage
Potato & Vegetable Warehouses
Refrigerators
Ice Boxes

Silvercote Fabric may be applied as a wall covering which provides waterproof interior finish and insulation in one application.



SILVERCOTE has a constant value.

SILVERCOTE prevents loss of heat in winter.

SILVERCOTE prevents discomfort in summer.

SILVERCOTE eliminates wall surface condensation.

SILVERCOTE reduces your decorating bill.

SILVERCOTE prevents internal condensation.

SILVERCOTE is impervious to moisture.

SILVERCOTE eliminates air infiltration through walls.

SILVERCOTE is washable and durable.

SILVERCOTE in walls has 100% more value at ½ the price.

SILVERCOTE is the only permanent moisture proof barrier against heat.

SILVERCOTE is manufactured under U.S. PAT. NO. 2,001,912; May 21, 1935.

SILVERCOTE PRODUCTS, INC.